



Environmental and Safety Designs, Inc.

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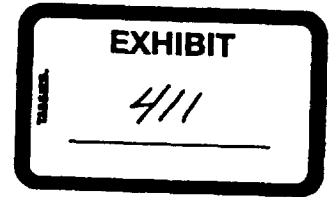
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February 28, 1994

Saad Site Technical Committee
Attention: Mr. Steve Dunn
Textron Aerostructures
1341 Vultee Boulevard
Nashville, Tennessee 37217



RE: REVIEW OF HYDROGEOLOGICAL REPORTS AT THE SAAD SITE

Dear Mr. Dunn:

Environmental and Safety Designs, Inc. (EnSafe) has conducted a review of the documentation related to the Saad Trousdale Road site (Site), Nashville, Tennessee, at the request of the Saad Site Technical Committee. EnSafe reviewed the following documents:

Removal Action/Field Investigation Report for the Saad Trousdale Site, March, 1992 by DRE Remedial Services, Inc. [DRE 1992]

Hydrogeological Evaluation for the Saad Site, February, 1993 by DRE Remedial Services, Inc. [February 1993]

Saad Site RA/FI Phase II Report for the Saad Trousdale Drive Site, April, 1993 by DRE Remedial Technologies, Inc. [DRE April 1993]

We understand that the United States Environmental Protection Agency (EPA) and the Saad Site Steering Committee have entered into an agreement for removal actions that involve offsite disposal of drums, soil, debris and water from the Site. Although extensive removal actions have been completed, the EPA has demanded further removal of soils and debris containing total recoverable petroleum hydrocarbons (TRPH) above 250 mg/kg.

EnSafe's review focused on the hydrogeological aspects of the Site and TRPH fate and transport issues as they may relate to the excavation work being sought by the EPA.

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The Context of Contamination

The reports EnSafe reviewed show TRPH levels above 250 mg/kg in soil samples collected on the Site during prior investigations. The TRPH data, however, suggest that the TRPH concentrations are not uniformly distributed in Site soils. We noted, for instance, that the Phase II report states that the shallow soils contain boulders, logs, and other large debris in contact with perched interstitial water (pp. 3-10 and 3-11). Soil samples collected in this context will yield elevated TRPH concentrations that are not representative of true soil contamination levels because oil residuals that collect in interstitial spaces "smear" both the debris and sandy clay soils. Thus the TRPH data overstate actual TRPH mass and may do so to a large degree depending upon the extent of the smearing effect.

Possibility of Recontamination Following Further Removal

If further removal work is undertaken, whether recontamination of clean fill materials from offsite sources will occur is an issue that must be considered. Several variables affect the likelihood of recontamination: the existence of offsite sources, the direction of contaminant migration, and the behavior of the perched water table. Based on the information that we have reviewed and our knowledge of land uses in the area, it is our opinion that offsite sources exist. One known offsite source is the Radnor Yards to the west of the Saad Site at which TRPH levels equal to or greater than those at the Saad Site have been reported.

Several reviewers, including the EPA, have noted that contaminant migration in the area of the Saad Site is a function of perched water moving on a subsurface clay layer which exists in the area and underlays a part of the Saad Site and Radnor Yards. A cross-section of the subsurface geology in the documentation shows this clay layer sloping to the west, which, EPA suggested, means that the perched water would flow toward the west away from the Saad Site. We do not agree with this interpretation.

The potentiometric data for the perched water table demonstrate that the flow in the perched water table is towards the Saad Site from the rail yard berm. The likely explanation for this groundwater flow direction is that the overlying rail yard creates a groundwater mound which causes water to flow radially, including a flow component toward the Saad Site. This scenario may be inferred from the highly permeable gravel used in rail yard construction which would allow for rapid infiltration of rainwater downward. The perched water on the Site may also be in hydraulic communication with and fed by the railroad berm which is 15 to 20 feet higher than the Saad Site in elevation; therefore, it is our opinion that the likelihood of migration of offsite contaminants onto the Saad Site is real.

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The perched water table will also fluctuate depending upon the amount of precipitation. Following rain events, the perched water table will rise and smear overlying fill material in the future. While this recontamination may result in lower levels than current conditions, its likelihood reduces the effectiveness of a plan to excavate and backfill over the perched water table.

Hydrogeological Considerations

Review of the existing information suggests that this area is coincidentally located on a structural high in the underlying Hermitage Formation, which, in our view, supports the reviewers who have suggested that a groundwater divide exists in the Radnor Yard area. The Hermitage Formation, which underlies the Bigby Limestone, is considered a regional aquitard, and would likely control the general direction of groundwater flow in the Bigby. The presence of the groundwater divide and the existence of a fractured limestone aquifer such as the Bigby Limestone, suggests that the hydrogeologic regime in this area is complex. While EPA has questioned the certainty of flow regimes in the Site reports due to the variation in time frame of data collection, following our review of the area geological information, we believe that the flow regimes are reasonable.


To go beyond generalized flow regimes, however, will require additional data collection. In the absence of such data collection and evaluation, a removal action is premature and indefensible.

If you have any questions regarding our review of the Saad Trousdale Road site, please do not hesitate to call us at (615) 399-8800.

Sincerely,

ENVIRONMENTAL AND SAFETY DESIGNS, INC.

Phillip G. Coop, CHMM
Project Manager


C. Todd Hughes
Sr. Geologist